D300102 HVAC - Laboratory Load Calculation Criteria

PART 1 - GENERAL

1.1 OVERVIEW

A. This section supplements Design Guideline Element D3001 with additional requirements for laboratory occupancies that the A/E must incorporate when calculating HVAC cooling and heating loads.

B. Load calculations must be performed in accordance with the latest ASHRAE Handbook of Fundamentals.

C. Refer to Design Guideline Element D3001 for general design criteria related to outdoor design conditions, internal loads, occupant density, occupant heat rejection, building envelope, and system zoning.

PART 2 - DESIGN CRITERIA

2.1 INDOOR DESIGN CONDITIONS

A. The following table applies to Laboratory spaces that are in addition to office spaces, which are listed in Design Guideline Element D3001.

Application	Summer Dry Bulb (°F)	Winter Dry Bulb (°F)	Relative Humidity (%)
Tissue Culture Room	74°F ± 2°F	70°F ± 2°F	30-50
Cold Room	19°F ± 0.1°F	19°F ± 0.1°F	30-50
Flex (Interim Space) Room	74°F ± 2°F	68°F ± 2°F	30-50
Chemical Fume Hood Room	74°F ± 2°F	68°F ± 2°F	30-50
Dark Room	70°F ± 2°F	68°F ± 2°F	30-50
LN 2 Freezer Room	74°F ± 2°F	68°F ± 2°F	30-50
Glass Wash Room	74°F ± 2°F	68°F ± 2°F	30-50
Storage Room	74°F ± 2°F	72°F ± 2°F	30-50
Equipment Room	75°F ± 2°F	68°F ± 2°F	25-50

B. Humidification for control shall be provided for applications where indicated.

1. Size the steam delivering capacity of the humidifier to maintain the room at mean 50 percent relative humidity and at minimum design air temperature of as indicated in the table above during winter minimum outside air temperature conditions.

2. Size the capacity to maintain relative humidity in the space at mean 50 percent at a maximum condition of 74 degrees F.

C. Coordinate environmental temperature limits and humidity requirements for special equipment in accordance with manufacturer's recommendations.

2.2 INTERNAL LOADS

A. When calculating HVAC system loads for selecting equipment, incorporate the following safety margins, unless directed otherwise by Owner during the Schematic Design phase or if the equipment designed for the space results in greater loads:

1. 8 watts per square foot for internal sensible power loads at receptacles.

2. Apply a 10 percent safety factor to sensible Btuh loads for system design capacity to the HVAC system.

2.3 VENTILATION LOADS

A. Refer to Design Guideline Element D304202 Laboratory Exhaust Ventilation for minimum air change rates applicable to different types of laboratory spaces and support rooms.

B. Different types of Biological Safety Cabinets with their design exhaust rates that affect room ventilation rates are listed within Design Guideline Element D304202.

2.4 SYSTEM ZONING

A. In determining zones for air handling unit service, consider the following:

1. Exhaust air from ducted BSC′s, chemical fume hoods, and radioisotope hoods shall be separated from the general exhaust air.

2. Consider zoning office areas and laboratory areas separately with service from different air handling systems. Systems such as vivariums shall be served from separate air handling systems.

3. Each tissue culture room and support room must have individual temperature control.

2.5 REHEAT REQUIRMENTS

A. When determining reheat load for spaces consider minimum air change and pressurization requirements to ensure reheat coils are not undersized.

PART 3 - SPECIAL CONTRACT DOCUMENT REQUIREMENTS

3.1 GENERAL

A. Unless stated otherwise in these Owner’s Design Guidelines, the A/E need not submit calculations or economic analysis for review. Copies must be retained and presented however, to Owner for review upon request.

PART 4 - PRODUCTS

4.1 GENERAL

A. Refer to Owner's Master Construction Specifications. These are available on the Owner's Design Guidelines website: http://www2.mdanderson.org/depts/cpm/standards/specs.html

PART 5 - DOCUMENT REVISION HISTORY

Issue	Date	Revision Description	Reviser
	20190301	Original Issuance	
Rev. 1			

END OF ELEMENT D300102